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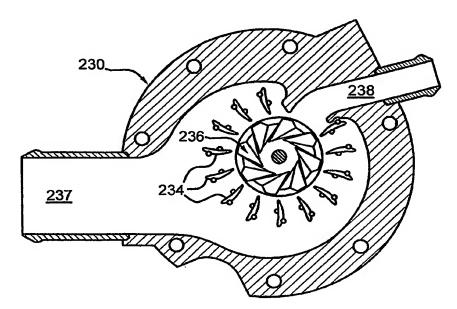
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[Continued on next page]

(54) Title: THERMAL CONTROL OF FLOWRATE IN ENGINE COOLANT SYSTEM



Flow variation is controlled by varying the orientation of the swirl-vanes. A change in orientation is effected by a thermal driver, e.g. a wax-type thermostat, which senses coolers temperature. a wax-type thermostat, which senses coolant temperature. The swirl-vanes boost the flowrate when the coolant is hot, and decrease it when the coolant cools. The swirl-vanes are mounted for pivoting, and are located just upstream from the pump impeller. The traditional engine-thermostat function is provided inside the pumping-chamber, in that the swirl-vanes can be operated to close off a port to the engine radiator. The thermal driver opens the radiator-port as the coolant goes from Cold to Warm; as the coolant goes from Warm to Hot, the thermal driver operates the swirl-vanes from flow-reduce to flow-boost.